Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

(DRAFT)
Title V, Operating
Permit: V-07-005
Dow Corning Corporation
Carrolton, Kentucky 41008
September 10, 2007
Luis D. Fuentes, Reviewer

SOURCE ID:	21-041-00004
SOURCE A.I. #:	703
ACTIVITY ID:	APE20040003

SOURCE DESCRIPTION:

Dow Corning Corporation is a synthetic organic chemical manufacturing industry (SOCMI) falling under SIC code Group 28. The primary operation at the Carrollton plant consists of the manufacturing of silicone-based compounds. The primary raw materials at the plant are silicon, methanol, hydrochloric acid, and methyl chloride. The methanol and hydrochloric acid are combined to produce methyl chloride, which is then reacted with the silicon metal to produce various silicone-based chemicals.

The plant also includes several support activities such as Utilities, Waste Treatment, Quality Assurance Laboratories, Barge Unloading, Product Shipping and Research & Development (labs and pilot plants).

COMMENTS:

a. Type of control and efficiency:
In addition to many local control devices, the primary control strategy for the plant is the Vent Header System (VHS), a complex collection and transport system for most of the major vents in the plant. Several hundred affected facilities are tied into the VHS, and the central control device in this system is a natural gas-fired thermal oxidizer, T-10. The T-10 Unit has been tested in 2002 for ethanol (destruction efficiency equal to 99.7 %), total non-methane hydrocarbon (99.994%), and methyl chloride (99.999%). In 2005 the unit was tested for halogens (99.9% and 99.87%). The testing was performed in accordance with NSPS requirements (40 CFR 60 Subparts NNN, RRR, and Kb).

Alternative control strategies under the VHS are the P-10 recycle mode and use of the B-2 Scrubber.

b. Emission factors and their source:
A combination of AP-42 emission factors, material balance, site testing and vendor guarantees have been used to estimate emissions in the application.

c. Applicable Regulations:
(Note: The following list does not include any generally applicable regulations)
401 KAR 51:017 (40 CFR 52.21) applies to the 703, 657 and 766 Boilers.
40 CFR 60 Subpart Dc (incorporated by reference in 401 KAR 60:005) applies to the 657, 767, 500, and 766 Boilers.
401 KAR 59:015 applies to the 703, 766, 767, 657, 500 Boilers, and the 3600, 5250 Furnaces.
40 CFR 60 Subpart Kb (incorporated by reference in 401 KAR 60:005) applies to several storage vessels at the plant, and to the emissions of voltaic organic compounds (VOC) that are sent to the Vent Heater System from Storage Tanks.
401 KAR 63:002, incorporating by reference 40 CFR 63 Subpart D applies to the emissions of hazardous air pollutants from several storage tanks, R-10 Process area, Waste Water Quench and Filter Press Processes, the A-2 Secondary Recovery and Vent Condenser for early reduction of HAPs.
401 KAR 60:005, incorporating by reference 40 CFR 60 Subpart RRR applies to some of the Reactors, Distillation Units, and emissions of voltaic organic compounds (VOC) that are sent to the Vent Heater System from reactor (see permit for details).
401 KAR 60:005, incorporating by reference 40 CFR 60 Subpart NNN applies to the emissions of voltaic organic compounds (VOC) that are sent to the Vent Heater System from Distillation Columns.
401 KAR 63:002, incorporating by reference 40 CFR 63.1-63.15 (National Emission Standards for Hazardous Air Pollutants, (General provisions), and 40 CFR 63 Subparts F, G, and H. Subparts F, G, and H apply to emissions from D-1 and D-10 CMPU's to the Vent Header System.
40 CFR 63 Subpart F (incorporated by reference in 401 KAR 63:002) applies to the Barge Unloading Dock, D-1 and D-10 Process Areas.
40 CFR 60 Subpart VV (incorporated by reference in 401 KAR 60:005) applies to the pipeline equipment in the Barge Unloading Dock, D-1 and D-10 Process Areas.
40 CFR 63 Subpart H (incorporated by reference in 401 KAR 63:002) applies to the pipeline equipment in the Barge Unloading Dock, D-1 and D-10 Process Areas.
401 KAR 59:010 applies to all the sources of non-combustion, process particulate emissions at the Carrollton plant.

d. Main modifications to the new permit:

Permit Activity / Project Description	Submittal Date
2000	
New DPR Quencher	3/16/2000
L-2 Furnace Replacement	9/11/2000
Administrative Date Change for the Compliance Certification	10/16/2000
By-Product Metal Process Trial	11/29/2000
5900 Materials Quenched in 883 Vessel s/954 Tank changes Plus T-10 Replacement	12/7/2000
L-2 Furnace Replacement	12/16/2000
By-Product Metal Process	12/20/2000
2001	

883 Quench with T-10 Upgrade	3/6/2001
HCL Unloading to T-1400 vent to C-2 Venturi	11/8/2001
DPR/Distillation Waste Quench Trial	9/20/2001
By-Product Metal-Clay Hopper and Baghouse	2001
2002	
Quench Pure Me2 Bottoms w/o T-10	3/7/2002
Temporary Boilers	5/28/2002
Revision for Temp. boilers, alternate unit	7/22/2002
T-5961, 3MS tank	7/24/2002
T-10 Residence Time	8/30/2002
2003	
D-1 and A-10 Absorber Perf. Test date changes	4/1/2003
New 657 Boiler and 717 Economizer	4/23/2003
Significant Revision Package: 883 Spl. Elim., 934 Baghouse, HON, D-1 and D-10 NSPS, SSM Plan.	7/3/2003
Removal of Requirement to P.T. D-1 and D-10.	9/29/2003
703 Boiler Modification: Addition of Economizer	10/1/2003
New 657 Boiler: NG ONLY	12/4/2003
2004	
Title V Renewal Application	5/5/2004
934 Baghouse Elimination	11/9/2004
D10.04 Cooling Tower: No longer using Ethylene glycol, no longer an E.R. Source, Insignificant source of VOC's	2004
Solar Grade Silicon	12/22/2004
883 Vent Sample only if vent to atmosphere	6/26/1905
2005	
36% HCl Tanks	3/7/2005
B30 Distillation Process: w/Form A and N for the B30 Boiler	9/26/05 and 11/23/05
Insignificant Activities: Baghouses	11/30/2005
2006	
Replace a Process A2 reactor with an identical one.	6/26/2006
D-10 process capacity increase. Removal of one distillation collumn.	7/31/2006
P-10 Analyzer: Change from IR to GC	5/2/2006
2007	

Change sample requirements for Spent Bed Processes: W.22 and W.25	3/30/2007
Remove monitoring requirements for emission points F2.01, F5.01, F5.02, F6.01 and L2.02. * See note below the table.	
Remove DPR.02 Scrubber and monitoring requirements	
Remove stack test requirements for the A10 Absorber: A10.11.	
Change monitoring requirements for emissions from FSU: W.02	
Revise description of C10.01 Venturi scrubber and add monitoring criteria.	
Redesignate baghouses from "control" to "recovery equipment: All "A" and "G" baghouses sand W.26.	
D10.04 Cooling Tower to Insignificant Activity	
Remove sampling requirement from the 883 Quencher: W.24.	
Alternative monitoring proposal, removing pH monitor & monitoring requirements. Water flow to the T-10 unit instead HCL.	

* Note:
Removal of the monitoring requirement for F2.01, F5.01, F5.02, F6.01, and L2.02 was based on the following data generated form the last three year's sampling:

Emission point	2004 (lbs/ year)	2005 (lbs/ year)	2006 (lbs/ year)
F2.01	19.6	40.7	20
F5.01	0.015	0.04	0.03
F5.02	0.22	0.65	3.6
F6.01	1.2	19.4	4.1
L2.02	43.6	20.9	9.6

EMISSION AND OPERATING CAPS DESCRIPTION:

FROM PERMIT V-99-050
The synthetic minor emission limits specified in permits C-88-068, C-89-015, and C-91-155 are no longer applicable to the Carrollton plant. The permittee is no longer required to comply with the individual 40 tpy emission caps for VOC specified in these 3 permits. A site –wide meeting analysis was done for the initial Title V permit to replace the individual VOC emission caps. The permittee has demonstrated that the net significant emission change for these projects over the 10 year period (1988- 1997) is less than 40 tons per year of volatile organic compounds (VOC).

PERIODIC MONITORING:

UTILITIES - BOILERS

a. The permittee shall monitor and maintain records of the following information:
   (1) The monthly (calendar month) fuel usage rate (cubic feet/month or gallons per month) of each of the fuels (natural gas, fuel oils #2) listed previously for each boiler.
   (2) The sulfur content of each type of fuel oil burned.
b. For the 767 and 500 Boilers, the permittee shall:
   (1) Install, calibrate, maintain, and operate a continuous monitoring system for measuring nitrogen oxides emissions in accordance with the procedures described in 40 CFR 60.48b (b), (c), (d), (e), and (f); or
   (2) [40 CFR 60.48b (g)(2)] - Monitor boiler operating conditions and predict nitrogen oxides emissions as specified in a plan submitted pursuant to 40 CFR 60.49b (c).
c. The 767 boiler is subject to 40 CFR 60 Subpart Db and is permitted to burn fuel oil #2 for up to 550 hours per year. 40 CFR 60.48b (b) requires installation of a continuous opacity monitoring system (COM) on this boiler. However, the permittee has been approved to use the alternative opacity monitoring procedures specified below. The specified procedures are valid only during operation of the boiler on fuel oil #2 and may not be used if any other liquid or solid fuels are burned in the boiler.
   (1) At least once every four hours during daylight shifts when oil is combusted, an observer certified in accordance with Method 9 shall perform 6-minute visible emission observations.
   (2) If the average opacity for a 6-minute set of readings, made in accordance with Condition (1) above, exceeds 10 percent, the observer shall collect two additional 6-minute sets of visible emission readings for a total of three data sets.
   (3) Records of the date and time of visible emission observations, along with the results of each observation, must be maintained.
d. If fuel oil # 2 is burned in the 703 or 766 boilers, then the permittee shall perform a qualitative visual observation of the opacity of emissions from each stack at least once per week. If visible emissions are seen, the permittee shall perform an EPA Reference Method 9 test for opacity on the applicable stack emission within 24 hours of observing visible emissions, and make any necessary repairs if the opacity exceeds the allowable limit.

UTILITIES - FURNACES

The permittee shall monitor and maintain records of the following information: the monthly (calendar month) fuel usage rate (cubic feet/month) of natural gas for each of the furnaces.

VENT HEADER SYSTEM

For the T-10 Unit:

a. The permittee shall monitor the parameters of the Vent Header System and control devices in accordance with the Subpart Kb Operating Plan. [40 CFR 60.113b(c)(2)]
b. The permittee shall install, calibrate, maintain, and operate according to manufacturer's specifications the following equipment: [40 CFR 60.663(a)]

i. A temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ± 0.5 ^{o}C, whichever is greater. The temperature monitoring device shall be installed in the firebox of the thermal oxidizer.
ii. A flow indicator that provides a record of vent stream flow to the thermal oxidizer at least once every hour for each 40 CFR 60 Subpart NNN distillation unit. The flow indicator shall be installed in the vent stream from each 40 CFR 60 Subpart NNN distillation unit at a point closest to the inlet of the thermal oxidizer and before being combined with any other vent stream. For all other affected facilities that vent to the Vent Header System, the permittee may install the flow indicator(s) at a point after two or more vent streams have been combined.

c. Pursuant to 40 CFR 63.114(a)4ii, scrubbing liquid flow to the T-10 unit will be monitored.
d. Pursuant to 40CFR 63.114(a)4ii(A), T-10 gas throughput will be monitored.

For the P-10 Unit:

a. Pursuant to 40 CFR 60.662(c), the permittee shall, as specified by the Administrator, monitor the process parameter(s) which would indicate proper operation and maintenance of the P-10 Adsorber.
Pursuant to 40 CFR 63 Subpart D, the permittee shall install, calibrate, maintain, and operate according to manufacturer's specifications the following equipment:
i. An on-line GC Analyzer calibrated for methyl chloride, to record at least once every 30 minutes during periods of operation.
ii. A flow indicator that provides records of the vent stream flow to the adsorption units from the A-2 and A-10 Process Areas. Flow shall be monitored and recorded at least once every 15 minutes during periods of operation.
iii. A flow indicator that provides records of the vent stream flow from the P-10 Adsorption Unit. Flow shall be monitored and recorded at least once every 15 minutes during periods of operation.

A-2 PROCESS AREA

a. Vent HAP and TOC (less methane and ethane) composition shall be determined on a daily basis.
b. Vent flowrate shall be determined on an hourly average basis.

A-10 PROCESS AREA

a. Vent HAP composition shall be determined on a daily basis.
b. Vent flowrate shall be determined on a continuous basis.

B PROCESSES CCR AREA, B-10 PROCESS AREA; and B-20 and B-30 PROCESS AREA

The permittee shall monitor the scrubbing liquid flowrate through the scrubber on a daily basis.

C PROCESS AREA SCRUBBERS

Water flowrate to the scrubbers shall be monitored daily.

C-2 PROCESS AREA SCRUBBERS

The permittee shall monitor the following parameters for each of the scrubbers listed above on a daily basis:

a. Vent stream flow rates.
b. Scrubbing liquid flowrates.

D-1 and D-10 PROCESSES

Group 1 Vents

a. The owner or operator of a Group I process vent shall comply with 40 CFR 63.114(d)(1) for any bypass line between the origin of the gas stream and the point where the gas reaches the process vent, as described in 40 CFR 63.107, that could divert the gas stream directly to the atmosphere. [40 CFR 63.114(d)]
b. Vent HAP composition shall be determined, at minimum, on a daily basis, when diverted to atmosphere. [40 CFR 63 Subpart D]
c. Vent flowrate shall be determined on an hourly average basis. [40 CFR 63 Subpart D]
d. All other required monitoring is contained in **Section B (6) Vent Header**.

Group 2 HON Wastewater Streams

e. An owner or operator shall comply with 40 CFR 63.114(a)(1) or (a)(2) for each wastewater stream to determine which wastewater streams require control. Parameters to be monitored include:
    i. Wastewater flow rate; and
    ii. Wastewater HAP concentration.

R-10 PROCESS AREA

The permittee shall monitor the liquid flowrate through the R-10 Rearranger Scrubber.

WASTEWATER TREATMENT PROCESS

a. Wastewater HAP concentrations shall be determined on a daily basis.
b. Wastewater flowrate shall be determined on an hourly average basis.

WASTEWATER QUENCH AND FILTER PRESS PROCESSES

a. The permittee shall take samples of vent gas and analyze for pollutant concentration as specified in V-07-005 Emission Limitations Compliance Demonstration Methods.
b. The permittee shall supply valid engineering estimates of volume flow rates as specified in V-05-005 Emission Limitations Compliance Demonstration Methods.
c. When 5900 materials are sent to Tank 954, analyze DPR gels using time lapse VOC analysis once a year.

GROUP REQUIREMENT 2 - PREVIOUS SYNTHETIC MINORS (PM_{10})

For T10.01, the permittee shall monitor whether the Ionizing Wet Scrubber (IWS) is operating or not, using hourly-average voltage data.

OPERATIONAL FLEXIBILITY:

None

CREDIBLE EVIDENCE:

This permit contains provisions, which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.